Identifying the dissolution mechanism of AA7050 aluminum alloy under cavitation erosion condition by EIS

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Abstract In this work, the EIS technology was used to study the cavitation erosion-corrosion mechanism of AA7050. EIS technology including charge transfer resistance, effective capacitance, and film resistance were used to characterize the electrochemical process during the cavitation erosion process. The whole cavitation erosion process can be divided into three stages: oncubation stage, acceleration stage and steady-state stage. The kinetic model of corrosion under cavitation erosion was proposed and its changes with the intensity and duration of cavitation were also discussed. Besides, charge transfer resistance can also distinguish the cavitation erosion mechanism well under different intensity of cavitation erosion resistance.

Keywords EIS, cavitation erosion, kinetic model.